

## DEMAND MANAGEMENT SCREENING TEST

### Umina Zone

#### Current Supply Arrangements

The system under consideration consists of Umina zone substation 11kV feeders 8, 10, 15, 16, 13, and 18. They supply the region surrounding Umina Zone, including Little Wobby, Pearl, Umina and Ettalong beaches, Patonga, Kilcare, and Blackwall. This area is predominately residential.

Feeder 16 is classified as rural, while the remainder are urban. This means different design planning criteria apply. Feeder 16 should be able to supply the maximum forecast load normally connected to it.

For feeders 8, 10, 13, 15 and 18, the system is designed so that if any one of these feeders experiences an outage, the loads on that feeder can be picked up by one or more of the interconnected feeders. This should be achieved with a maximum of 3-5 switching operations, which aligns with the licence requirement that 11kV customer interruptions in urban areas should be less than 4 hours.

#### Supply Capacity and Demand Forecast

The load at Umina zone, including feeders 8, 10, 13, 15, 16 and 18, is forecast to grow at 2.7% per annum in summer and 0.7% per annum in winter. The load in this area is predominantly residential with daytime peaks, with summer peak demand higher than in winter.

The table below summarises the worst case loading scenario for feeders in the system under review for summer 2009/10:

Feeder	Scenario	Capacity of limiting section	Emergency loading	DM requirement
8	Failure of critical section of feeder 19	2.1	3.51	1.41
10	Failure of critical section of feeder 15	3.43	5.98	1.05
15	Failure of critical section of feeder 15	3.43	5.98	1.51
13	Failure of critical section of feeder 18	2.95	5.13	2.17
16	System normal	1.62	2.29	0.67
18	Failure of critical section of feeder 13	2.86	3.24	0.38

It may be that reductions relating to one scenario would contribute to resolving problems with other scenarios, although this would require load to be reduced in very specific locations. We estimate that the best possible situation would mean a total load reduction requirement of 5.8MVA, and that it could reasonably be as high as 7.2MVA

#### Supply Strategy Option

The preferred supply side option is to create two new 11kV feeders, to create a total of four 11kV feeders, from the existing feeders 10 and 15 at Umina zone substation,

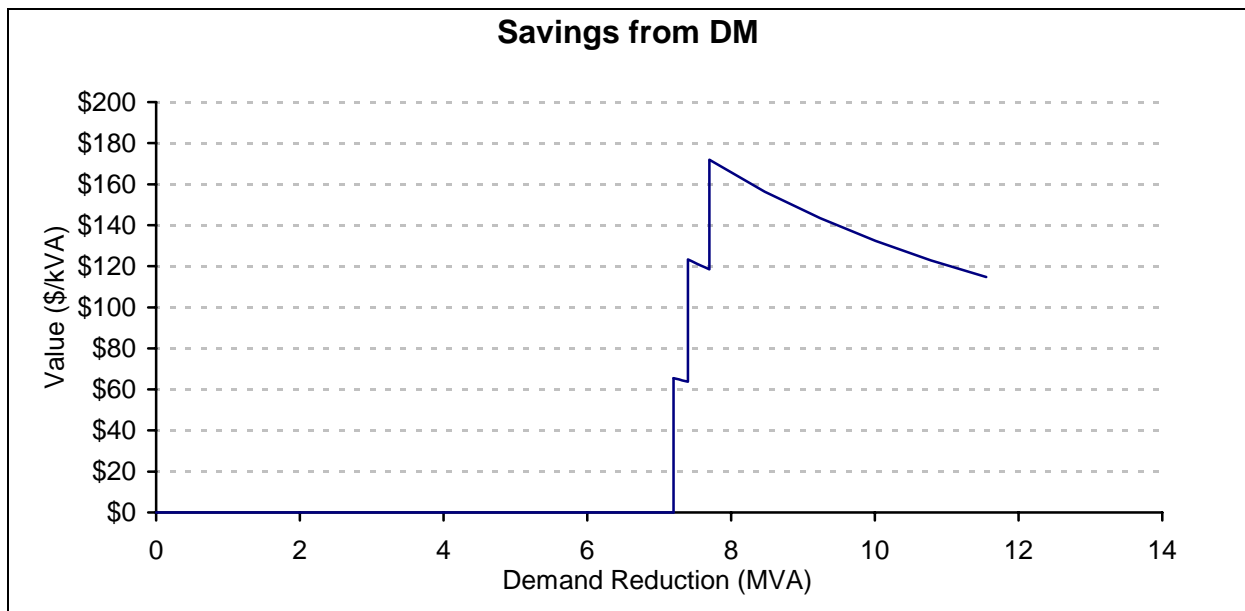
along with some rearrangement of existing network assets. The cost of this project is estimated at \$6,020,000.

To meet the required completion date of November 2009 a decision on this investment would need to be made as soon as possible.

### Required Demand Management Characteristics

To achieve a one year deferral of the proposed investment, we would need to identify and implement between 5.8 and 7.2 MVA of demand management by November 2009. This would be equivalent to 22% to 28% of the forecast load of the relevant feeders. The cost saving from of a one year deferral is \$440,000 or between \$77 and \$61/kVA, which is low.

Longer deferrals would lead to increased savings, but would require larger demand reductions.



Regardless of whether overlaps are possible or not, the size of the reduction required is very large in both absolute terms and in relation to the loads on the specific feeder sections involved. This would be difficult to achieve at any cost. Partly as a consequence of the large reduction required, the savings (in per kVA terms) are quite low.

### Recommendation

Based on this analysis it is not considered reasonable to expect that it would be cost-effective to postpone the proposed supply-side solution by implementing demand management strategies.